SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

April 5, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7304

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 29979

The sample was taken on 2/02/93 and was received at Sound on 2/03/93. The sample was analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS
Sample 29979-1 was extracted and analyzed on 2/05/93. Methylene chloride, acetone, and toluene were detected in the method blank at levels above the IDL. Sample results for these compounds were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS
Sample 29979-1 was extracted on 2/12/93 and analyzed on 2/26/93. Di-n-butylphthalate was detected in the method blank above the IDL. Sample results for this compound were flagged B to indicate this. MS/MSD percent recoveries for 1,4-dichlorobenzene were below QC limits. All other QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS
Sample 29979-1 was extracted and analyzed on 2/08/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS
Sample 29979-1 was extracted and analyzed on 2/09/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services

Date: March 6, 1993

Report On: Analysis of Soil

Lab No.: 29979

IDENTIFICATION:
Sample received on 02-03-93
Project: 624878-7302 Pier 91
Client ID: CP-115B-18-20

ANALYSIS:

Volatile Organics by Method 8240
Date Extracted: 2-5-93
Date Analyzed: 2-5-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	230	5	B2
Acetone	51	50	B2
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29979
March 6, 1993

Client ID: CP-115B-18-20

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	4.9	5	J,B1
Chlorobenzene	ND	5	
Ethyl Benzene	5.3	5	
Styrene	ND	5	
Total Xylenes	4.9	5	J

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	99	88 - 110	81 - 117
Bromofluorobenzene	98	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29979
March 6, 1993

Client ID: CP-115B-18-20

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 2-12-93
Date Analyzed: 2-26-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	430	
bis(2-Chloroethyl) ether	ND	430	
2-Chlorophenol	ND	430	
1,3-Dichlorobenzene	ND	430	
1,4-Dichlorobenzene	ND	430	
Benzyl Alcohol	ND	860	
1,2-Dichlorobenzene	ND	430	
2-Methylphenol	ND	430	
bis(2-Chloroisopropyl)ether	ND	430	
4-Methylphenol	ND	430	
N-Nitroso-Di-N-propylamine	ND	430	
Hexachloroethane	ND	430	
Nitrobenzene	ND	430	
Isophorone	ND	430	
2-Nitrophenol	ND	430	
2,4-Dimethylphenol	ND	430	
Benzoic Acid	ND	2,100	
bis(2-Chloroethoxy)methane	ND	430	
2,4-Dichlorophenol	ND	430	
1,2,4-Trichlorobenzene	ND	430	
Naphthalene	ND	430	
4-Chloroaniline	ND	860	
Hexachlorobutadiene	ND	430	
4-Chloro-3-methylphenol	ND	860	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29979
March 6, 1993

Client ID: CP-115B-18-20

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	430	
Hexachlorocyclopentadiene	ND	430	
2,4,6-Trichlorophenol	ND	430	
2,4,5-Trichlorophenol	ND	430	
2-Chloronaphthalene	ND	430	
2-Nitroaniline	ND	2,100	
Dimethyl phthalate	ND	430	
Acenaphthylene	ND	430	
2,6-Dinitrotoluene	ND	430	
3-Nitroaniline	ND	2,100	
Acenaphthene	ND	430	
2,4-Dinitrophenol	ND	2,100	
4-Nitrophenol	ND	2,100	
Dibenzofuran	ND	430	
2,4-Dinitrotoluene	ND	430	
Diethylphthalate	ND	430	
4-Chlorophenyl phenyl ether	ND	430	
Fluorene	ND	430	
4-Nitroaniline	ND	2,100	
4,6-Dinitro-2-methylphenol	ND	2,100	
N-Nitrosodiphenylamine	ND	430	
4-Bromophenyl phenyl ether	ND	430	
Hexachlorobenzene	ND	430	
Pentachlorophenol	ND	2,100	
Phenanthrene	ND	430	
Anthracene	ND	430	
Di-n-butylphthalate	150	430	J

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29979
March 6, 1993

Client ID: CP-115B-18-20

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	430	
Pyrene	ND	430	
Butyl benzyl phthalate	ND	430	
3,3'-Dichlorobenzidine	ND	860	
Benzo(a)anthracene	ND	430	
Chrysene	ND	430	
bis(2-ethylhexyl)phthalate	ND	430	
Di-n-octyl phthalate	ND	430	
Benzo(b)fluoranthene	ND	430	
Benzo(k)fluoranthene	ND	430	
Benzo(a)pyrene	ND	430	
Indeno(1,2,3-cd)pyrene	ND	430	
Dibenz(a,h)anthracene	ND	430	
Benzo(g,h,i)perylene	ND	430	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	38	35 - 114	23 - 120
2-Fluorobiphenyl	42	43 - 116	30 - 115
p-Terphenyl-d_{14}	81	33 - 141	18 - 137
Phenol-d_6	55	10 - 94	24 - 113
2-Fluorophenol	59	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29979
March 6, 1993

Client ID: CP-115B-18-20

TPH Per EPA Method 418.1
Date Extracted: 2-9-93
Date Analyzed: 2-9-93

Total Petroleum Hydrocarbons, mg/kg	31

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 2-9-93
Date Analyzed: 2-9-93

Total Petroleum Fuel Hydrocarbons, mg/kg	< 10

SURROGATE RECOVERY, %	
1-chlorooctane	91
o-terphenyl	88

SOUND ANALYTICAL SERVICES

ANDREW J. RIDDELL

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 29979qc1
Matrix: Soil
Units: mg/kg
Date: March 6, 1993

DUPLICATE

Dup. No. 29979-1

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Fuel Hydrocarbons	< 10	< 10	0.0
SURROGATE RECOVERY%			
1-chlorooctane	91	109	
o-terphenyl	88	103	

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE RECOVERY

MSD No. 29979-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Flag
Total Petroleum Fuel Hydrocarbons	< 10	510	528	97	

%R = Percent Recovery
= [(MS - SR) / SA] x 100

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 29979qc1
Units: mg/kg
Date: March 6, 1993

BLANK SPIKE RECOVERY

BS No. 006F0101.D

Parameter	Spike Added	Spike Recovered	%R
Total Petroleum Fuel Hydrocarbons	402	285	71

%R = Percent Recovery
= [(MS - SR) / SA] x 100

METHOD BLANK

Blank No. 005F0101.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 10
SURROGATE RECOVERY%	
1-chlorooctane	105
o-terphenyl	103

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Technical Services
Lab No: 29979qc2
Matrix: Soil
Units: mg/kg
Date: March 6, 1993

DUPLICATE

Dup No. 29979-1

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Hydrocarbons	31	32	3.2

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2] x 100

MATRIX SPIKE RECOVERY

MSD No. 29979-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Flag
Total Petroleum Hydrocarbons	31	1,200	1,204	97	

%R = Percent Recovery
= [(MS - SR) / SA] x 100

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29979qc3
Units: ug/kg
Date: March 6, 1993
Blank No: V8374

METHOD BLANK

Compound	Blank Value	PQL	FLAGS
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	470	5	
Acetone	14	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	4.1	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29979qc3
Units: ug/kg
Date: March 6, 1993
Blank No: V8374

METHOD BLANK

ND - Not Detected

PQL - Practical Quantitation Limit

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	97	86 - 115	81 - 117
Bromofluorobenzene	97	76 - 114	74 - 121
1,2-Dichloroethane d4	114	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29979qc4
Units: ug/kg
Date: March 6, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 29979-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	Spike Added (SA)	%R	RPD
1,1-DCE	ND	82	64	128.0	90	64	140.0	9.3
TCE	ND	63	64	98.4	63	64	98.4	0.0
Chloro-benzene	ND	68	64	106.0	68	64	106.0	0.0
Toluene	ND	82	64	128.0	84	64	131.0	2.4
Benzene	ND	77	64	120.0	77	64	120.0	0.0

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

% REC = Percent Recovery
= [(MS - SAMPLE RESULT) / SPIKE] x 100

Advisory Limits:

	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29979qc5
Units: ug/kg
Date: March 6, 1993
Blank No: SBLK47-S7957

METHOD BLANK

Compound	Blank Value	PQL	Flags
Phenol	ND	330	
bis(2-Chloroethyl) ether	ND	330	
2-Chlorophenol	ND	330	
1,3-Dichlorobenzene	ND	330	
1,4-Dichlorobenzene	ND	330	
Benzyl Alcohol	ND	670	
1,2-Dichlorobenzene	ND	330	
2-Methylphenol	ND	330	
bis(2-Chloroisopropyl)ether	ND	330	
4-Methylphenol	ND	330	
N-Nitroso-Di-N-propylamine	ND	330	
Hexachloroethane	ND	330	
Nitrobenzene	ND	330	
Isophorone	ND	330	
2-Nitrophenol	ND	330	
2,4-Dimethylphenol	ND	330	
Benzoic Acid	ND	1,700	
bis(2-Chloroethoxy)methane	ND	330	
2,4-Dichlorophenol	ND	330	
1,2,4-Trichlorobenzene	ND	330	
Naphthalene	ND	330	
4-Chloroaniline	ND	670	
Hexachlorobutadiene	ND	330	
4-Chloro-3-methylphenol	ND	670	
2-Methylnaphthalene	ND	330	
Hexachlorocyclopentadiene	ND	330	
2,4,6-Trichlorophenol	ND	330	
2,4,5-Trichlorophenol	ND	330	
2-Chloronaphthalene	ND	330	
2-Nitroaniline	ND	1,700	
Dimethyl phthalate	ND	330	
Acenaphthylene	ND	330	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29979qc5
Units: ug/kg
Date: March 6, 1993
Blank No: SBLK47-S7957

METHOD BLANK

Compound	Blank Value	PQL	Flags
3-Nitroaniline	ND	1,700	
Acenaphthene	ND	330	
2,4-Dinitrophenol	ND	1,700	
4-Nitrophenol	ND	1,700	
Dibenzofuran	ND	330	
2,4-Dinitrotoluene	ND	330	
2,6-Dinitrotoluene	ND	330	
Diethylphthalate	ND	330	
4-Chlorophenyl phenyl ether	ND	330	
Fluorene	ND	330	
4-Nitroaniline	ND	1,700	
4,6-Dinitro-2-methylphenol	ND	1,700	
N-Nitrosodiphenylamine	ND	330	
4-Bromophenyl phenyl ether	ND	330	
Hexachlorobenzene	ND	330	
Pentachlorophenol	ND	1,700	
Phenanthrene	ND	330	
Anthracene	ND	330	
Di-n-butylphthalate	2,100	330	
Fluoranthene	ND	330	
Pyrene	ND	330	
Butyl benzyl phthalate	ND	330	
3,3'-Dichlorobenzidine	ND	670	
Benzo(a)anthracene	ND	330	
bis(2-ethylhexyl)phthalate	ND	330	
Chrysene	ND	330	
Di-n-octyl phthalate	ND	330	
Benzo(b)fluoranthene	ND	330	
Benzo(k)fluoranthene	ND	330	
Benzo(a)pyrene	ND	330	
Indeno(1,2,3-cd)pyrene	ND	330	
Dibenz(a,h)anthracene	ND	330	
Benzo(g,h,i)perylene	ND	330	

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29979qc5
Units: ug/kg
Date: March 6, 1993
Blank No: SBLK47-S7957

ND - Not Detected.

PQL - Practical Quantitation Limit

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	76	35 - 114	23 - 120
2-Fluorobiphenyl	77	43 - 116	30 - 115
p-Terphenyl-d14	89	33 - 141	18 - 137
Phenol-d6	67	10 - 94	24 - 113
2-Fluorophenol	79	21 - 100	25 - 121
2,4,6-TBP	75	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 29979qc6
Date: March 6, 1993

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	4,200	ND	1,900	44	2,300	55	22.0	
2-Chlorophenol	4,200	ND	1,900	44	2,300	55	22.0	
1,4-Dichlorobenzene	4,200	ND	500	12	720	17	34.0	X6
N-nitrosodi-n-Propylamine	4,200	ND	2,100	50	2,300	55	9.5	
1,2,4-Trichlorobenzene	4,200	ND	1,300	31	1,600	38	20.0	
4-Chloro-3-Methylphenol	4,200	ND	2,000	48	2,500	60	22.0	
Acenaphthene	4,200	ND	2,200	52	2,300	55	5.6	
4-Nitrophenol	4,200	ND	1,500	36	1,800	43	18.0	
2,4 Dinitrotoluene	4,200	ND	2,500	60	2,800	67	11.0	
Pentachlorophenol	4,200	ND	1,300	31	1,700	40	25.0	
Pyrene	4,200	ND	2,600	62	2,600	62	0.0	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	35	26 - 90
2-Chlorophenol	50	25 - 102
1,4-Dichlorobenzene	27	28 - 104
N-nitrosodi-n-Propylamine	38	41 - 126
1,2,4-Trichlorobenzene	23	38 - 107
4-Chloro-3-Methylphenol	33	26 - 103
Acenaphthene	19	31 - 137
4-Nitrophenol	50	11 - 114
2,4 Dinitrotoluene	47	28 - 89
Pentachlorophenol	47	17 - 109
Pyrene	36	35 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final exract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6088

PROJECT NAME BET PIER 91 RFI
PROJECT NUMBER 621878 MAJOR TASK 7304
SAMPLERS J. Perre
LAB DESTINATION S.A.S.

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: VOC	TPH 418.1	TPH 8015-BUA				ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	2/2/93	1115		X	CP-115B-18-20	2	X	X	X	X				X	

RELINQUISHED BY

SIGNATURE	DATE	TIME
J. Palmy	2/3/93	1025
J. Palmy	2-7-93	12:35

RECEIVED BY

SIGNATURE	DATE	TIME
J. Palmy	2-3/93	10:25A
S. Chiang SAS	2/3/93	1235pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

April 5, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7304

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 30488

Samples were taken on 2/24/93 and were received at Sound on 3/02/93. Samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 30488-1 and 30488-2 were extracted and analyzed on 3/04/93. Methylene chloride, acetone, and toluene were detected in the method blank at levels above the IDL. Sample results for these compounds were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 30488-1 and 30488-2 were extracted on 3/03/93 and analyzed on 3/12/93. Di-n-butylphthalate was detected in the method blank above the PQL. Sample results for this compound were flagged B to indicate this. MS/MSD percent recoveries for 1,2,4-trichlorobenzene and 1,4-dichlorobenzene were below QC limits. All other QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 30488-1 and 30488-2 were extracted and analyzed on 3/03/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 30488-1 and 30488-2 were extracted and analyzed on 3/04/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services
Date: March 16, 1993

Report On: Analysis of Soil
Lab No.: 30488

IDENTIFICATION:
Sample received on 03-02-93
Project: 624878-7304 Pier 91

ANALYSIS:

Lab No. 30488-1
Client ID: CP-122B-32-36

Volatile Organics by Method 8240
Date Extracted: 3-4-93
Date Analyzed: 3-4-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	12.0	
Bromomethane	ND	12.0	
Vinyl Chloride	ND	12.0	
Chloroethane	ND	12.0	
Methylene Chloride	110	6.0	B1
Acetone	45	60.0	B1, J
Carbon Disulfide	ND	6.0	
1,1-Dichloroethene	ND	6.0	
1,1-Dichloroethane	ND	6.0	
1,2-Dichloroethene (Total)	ND	6.0	
Chloroform	0.91	6.0	J
1,2-Dichloroethane	ND	6.0	
2-Butanone	ND	30.0	
1,1,1-Trichloroethane	ND	6.0	
Carbon Tetrachloride	ND	6.0	
Vinyl Acetate	ND	30.0	
Bromodichloromethane	ND	6.0	
1,2-Dichloropropane	ND	6.0	
Cis-1,3-Dichloropropene	ND	6.0	
Trichloroethene	ND	6.0	
Dibromochloromethane	ND	6.0	
1,1,2-Trichloroethane	ND	6.0	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-1 Client ID: CP-122B-32-36

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	6.0	
Trans-1,3-Dichloropropene	ND	6.0	
Bromoform	ND	6.0	
4-Methyl-2-Pentanone	ND	30.0	
2-Hexanone	ND	6.0	
Tetrachloroethene	ND	6.0	
1,1,2,2-Tetrachloroethane	ND	6.0	
Toluene	8.1	6.0	B1
Chlorobenzene	ND	6.0	
Ethyl Benzene	3.7	6.0	J
Styrene	ND	6.0	
Total Xylenes	4.4	6.0	J

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	105	88 - 110	81 - 117
Bromofluorobenzene	90	86 - 115	74 - 121
1,2-Dichloroethane-D4	96	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Lab No. 30488-1 Client ID: CP-122B-32-36

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 3-3-93
Date Analyzed: 3-12-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	410	
bis(2-Chloroethyl) ether	ND	410	
2-Chlorophenol	ND	410	
1,3-Dichlorobenzene	ND	410	
1,4-Dichlorobenzene	ND	410	
Benzyl Alcohol	ND	810	
1,2-Dichlorobenzene	ND	410	
2-Methylphenol	ND	410	
bis(2-Chloroisopropyl)ether	ND	410	
4-Methylphenol	ND	410	
N-Nitroso-Di-N-propylamine	ND	410	
Hexachloroethane	ND	410	
Nitrobenzene	ND	410	
Isophorone	ND	410	
2-Nitrophenol	ND	410	
2,4-Dimethylphenol	ND	410	
Benzoic Acid	ND	2,000	
bis(2-Chloroethoxy)methane	ND	410	
2,4-Dichlorophenol	ND	410	
1,2,4-Trichlorobenzene	ND	410	
Naphthalene	ND	410	
4-Chloroaniline	ND	810	
Hexachlorobutadiene	ND	410	
4-Chloro-3-methylphenol	ND	810	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-1 Client ID: CP-122B-32-36

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	410	
Hexachlorocyclopentadiene	ND	410	
2,4,6-Trichlorophenol	ND	410	
2,4,5-Trichlorophenol	ND	410	
2-Chloronaphthalene	ND	410	
2-Nitroaniline	ND	2,000	
Dimethyl phthalate	ND	410	
Acenaphthylene	ND	410	
2,6-Dinitrotoluene	ND	410	
3-Nitroaniline	ND	2,000	
Acenaphthene	ND	410	
2,4-Dinitrophenol	ND	2,000	
4-Nitrophenol	ND	2,000	
Dibenzofuran	ND	410	
2,4-Dinitrotoluene	ND	410	
Diethylphthalate	ND	410	
4-Chlorophenyl phenyl ether	ND	410	
Fluorene	ND	410	
4-Nitroaniline	ND	2,000	
4,6-Dinitro-2-methylphenol	ND	2,000	
N-Nitrosodiphenylamine	ND	410	
4-Bromophenyl phenyl ether	ND	410	
Hexachlorobenzene	ND	410	
Pentachlorophenol	ND	2,000	
Phenanthrene	ND	410	
Anthracene	ND	410	
Di-n-butylphthalate	260	410	B1,J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-1 Client ID: CP-122B-32-36

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	410	
Pyrene	ND	410	
Butyl benzyl phthalate	ND	410	
3,3'-Dichlorobenzidine	ND	810	
Benzo(a)anthracene	ND	410	
Chrysene	ND	410	
bis(2-ethylhexyl)phthalate	ND	410	
Di-n-octyl phthalate	ND	410	
Benzo(b)fluoranthene	ND	410	
Benzo(k)fluoranthene	ND	410	
Benzo(a)pyrene	ND	410	
Indeno(1,2,3-cd)pyrene	ND	410	
Dibenz(a,h)anthracene	ND	410	
Benzo(g,h,i)perylene	ND	410	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	40	35 - 114	23 - 120
2-Fluorobiphenyl	49	43 - 116	30 - 115
p-Terphenyl-d_{14}	72	33 - 141	18 - 137
Phenol-d_6	61	10 - 94	24 - 113
2-Fluorophenol	56	21 - 100	25 - 121
2,4,6-Tribromophenol	72	10 - 123	19 - 122

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-1 Client ID: CP-122B-32-36

TPH Per EPA Method 418.1
Date Extracted: 3-4-93
Date Analyzed: 3-4-93

Parameter	Concentration, mg/kg	Flag
Total Petroleum Hydrocarbons	26	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 3-3-93
Date Analyzed: 3-3-93

Parameter	Concentration, mg/kg	Flag
Total Petroleum Fuel Hydrocarbons	< 10	
SURROGATE RECOVERY, %		
1-chlorooctane	99	
o-terphenyl	102	

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

Volatile Organics by Method 8240
Date Extracted: 3-4-93
Date Analyzed: 3-4-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	10.0	
Bromomethane	ND	10.0	
Vinyl Chloride	ND	10.0	
Chloroethane	ND	10.0	
Methylene Chloride	150	5.0	B1
Acetone	57	50.0	
Carbon Disulfide	0.89	5.0	J
1,1-Dichloroethene	ND	5.0	
1,1-Dichloroethane	ND	5.0	
1,2-Dichloroethene (Total)	ND	5.0	
Chloroform	0.87	5.0	J
1,2-Dichloroethane	ND	5.0	
2-Butanone	ND	25.0	
1,1,1-Trichloroethane	ND	5.0	
Carbon Tetrachloride	ND	5.0	
Vinyl Acetate	ND	25.0	
Bromodichloromethane	ND	5.0	
1,2-Dichloropropane	ND	5.0	
Cis-1,3-Dichloropropene	ND	5.0	
Trichloroethene	ND	5.0	
Dibromochloromethane	ND	5.0	
1,1,2-Trichloroethane	ND	5.0	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	5.0	
Trans-1,3-Dichloropropene	ND	5.0	
Bromoform	ND	5.0	
4-Methyl-2-Pentanone	ND	25.0	
2-Hexanone	ND	5.0	
Tetrachloroethene	ND	5.0	
1,1,2,2-Tetrachloroethane	ND	5.0	
Toluene	6.9	5.0	B1
Chlorobenzene	ND	5.0	
Ethyl Benzene	4.1	5.0	J
Styrene	ND	5.0	
Total Xylenes	7.0	5.0	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	106	88 - 110	81 - 117
Bromofluorobenzene	92	86 - 115	74 - 121
1,2-Dichloroethane-D4	93	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 3-3-93
Date Analyzed: 3-12-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	390	
bis(2-Chloroethyl) ether	ND	390	
2-Chlorophenol	ND	390	
1,3-Dichlorobenzene	ND	390	
1,4-Dichlorobenzene	ND	390	
Benzyl Alcohol	ND	780	
1,2-Dichlorobenzene	ND	390	
2-Methylphenol	ND	390	
bis(2-Chloroisopropyl)ether	ND	390	
4-Methylphenol	ND	390	
N-Nitroso-Di-N-propylamine	ND	390	
Hexachloroethane	ND	390	
Nitrobenzene	ND	390	
Isophorone	ND	390	
2-Nitrophenol	ND	390	
2,4-Dimethylphenol	ND	390	
Benzoic Acid	ND	2,000	
bis(2-Chloroethoxy)methane	ND	390	
2,4-Dichlorophenol	ND	390	
1,2,4-Trichlorobenzene	ND	390	
Naphthalene	ND	390	
4-Chloroaniline	ND	780	
Hexachlorobutadiene	ND	390	
4-Chloro-3-methylphenol	ND	780	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	390	
Hexachlorocyclopentadiene	ND	390	
2,4,6-Trichlorophenol	ND	390	
2,4,5-Trichlorophenol	ND	390	
2-Chloronaphthalene	ND	390	
2-Nitroaniline	ND	2,000	
Dimethyl phthalate	ND	390	
Acenaphthylene	ND	390	
2,6-Dinitrotoluene	ND	390	
3-Nitroaniline	ND	2,000	
Acenaphthene	ND	390	
2,4-Dinitrophenol	ND	2,000	
4-Nitrophenol	ND	2,000	
Dibenzofuran	ND	390	
2,4-Dinitrotoluene	ND	390	
Diethylphthalate	ND	390	
4-Chlorophenyl phenyl ether	ND	390	
Fluorene	ND	390	
4-Nitroaniline	ND	2,000	
4,6-Dinitro-2-methylphenol	ND	2,000	
N-Nitrosodiphenylamine	ND	390	
4-Bromophenyl phenyl ether	ND	390	
Hexachlorobenzene	ND	390	
Pentachlorophenol	ND	2,000	
Phenanthrene	ND	390	
Anthracene	ND	390	
Di-n-butylphthalate	260	390	B1,J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	390	
Pyrene	ND	390	
Butyl benzyl phthalate	ND	390	
3,3'-Dichlorobenzidine	ND	780	
Benzo(a)anthracene	ND	390	
Chrysene	ND	390	
bis(2-ethylhexyl)phthalate	ND	390	
Di-n-octyl phthalate	ND	390	
Benzo(b)fluoranthene	ND	390	
Benzo(k)fluoranthene	ND	390	
Benzo(a)pyrene	ND	390	
Indeno(1,2,3-cd)pyrene	ND	390	
Dibenz(a,h)anthracene	ND	390	
Benzo(g,h,i)perylene	ND	390	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	40	35 - 114	23 - 120
2-Fluorobiphenyl	51	43 - 116	30 - 115
p-Terphenyl-d_{14}	73	33 - 141	18 - 137
Phenol-d_6	65	10 - 94	24 - 113
2-Fluorophenol	60	21 - 100	25 - 121
2,4,6-Tribromophenol	76	10 - 123	19 - 122

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7304 Pier 91

Lab No. 30488
March 16, 1993

Lab No. 30488-2 Client ID: CP-122B-39-41

TPH Per EPA Method 418.1
Date Extracted: 3-4-93
Date Analyzed: 3-4-93

Parameter	Concentration, mg/kg	Flag
Total Petroleum Hydrocarbons	24	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 3-3-93
Date Analyzed: 3-3-93

Parameter	Concentration, mg/kg	Flag
Total Petroleum Fuel Hydrocarbons	< 10	
SURROGATE RECOVERY, %		
1-chlorooctane	82	
o-terphenyl	83	

SOUND ANALYTICAL SERVICES

Andrew J. Riddell

ANDREW J. RIDDELL

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Technical Services
Lab No: 30488qc1
Matrix: Soil
Units: mg/kg
Date: March 16, 1993

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 30488-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	MS %R	Spike Dup Result (MSD)	MSD %R	RPD	Flag
TPH	26	1,100	1,106	97.1	1,100	97.6	0.0	

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 30488qc2
Matrix: Soil
Units: mg/kg
Date: March 16, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 30488-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	< 10	480	474	101	490	2.1

%R = Percent Recovery
= [(MS - SR) / SA] x 100
RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

BLANK SPIKE RECOVERY

BS No. 004F0101.D

Parameter	Spike Added	Spike Recovered	%R
Diesel	402	321	80

%R = Percent Recovery
= [(BS - SR) / SA] x 100

METHOD BLANK

Blank No. 003F0101.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 100
SURROGATE RECOVERY%	
1-chlorooctane	99
o-terphenyl	99

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 30488qc3
Units: ug/kg
Date: March 16, 1993
Blank No: V8902

METHOD BLANK

Compound	Blank Value	PQL	FLAGS
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	48	5	
Acetone	7.0	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	1.4	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 30488qc3
Units: ug/kg
Date: March 16, 1993
Blank No: V8902

METHOD BLANK

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	97	86 - 115	81 - 117
Bromofluorobenzene	98	76 - 114	74 - 121
1,2-Dichloroethane d4	94	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 30488qc4
Units: ug/kg
Date: March 16, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 30488-2

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	Spike Added (SA)	%R	RPD
1,1-DCE	ND	60	55	109	69	55	125	8.7
TCE	ND	59	55	107	65	55	118	9.7
Chloro-benzene	ND	65	55	118	64	55	116	1.6
Toluene	ND	76	55	138	79	55	144	3.9
Benzene	ND	62	55	113	66	55	120	6.3

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

% REC = Percent Recovery
= [(MS - SAMPLE RESULT) / SPIKE] x 100

ND - Not Detected

Advisory Limits:

	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 30488qc5
Units: ug/kg
Date: March 16, 1993
Blank No: SBLK60-S8095

METHOD BLANK

Compound	Blank Value	PQL	Flags
Phenol	ND	330	
bis(2-Chloroethyl) ether	ND	330	
2-Chlorophenol	ND	330	
1,3-Dichlorobenzene	ND	330	
1,4-Dichlorobenzene	ND	330	
Benzyl Alcohol	ND	670	
1,2-Dichlorobenzene	ND	330	
2-Methylphenol	ND	330	
bis(2-Chloroisopropyl)ether	ND	330	
4-Methylphenol	ND	330	
N-Nitroso-Di-N-propylamine	ND	330	
Hexachloroethane	ND	330	
Nitrobenzene	ND	330	
Isophorone	ND	330	
2-Nitrophenol	ND	330	
2,4-Dimethylphenol	ND	330	
Benzoic Acid	ND	1,700	
bis(2-Chloroethoxy)methane	ND	330	
2,4-Dichlorophenol	ND	330	
1,2,4-Trichlorobenzene	ND	330	
Naphthalene	ND	330	
4-Chloroaniline	ND	670	
Hexachlorobutadiene	ND	330	
4-Chloro-3-methylphenol	ND	670	
2-Methylnaphthalene	ND	330	
Hexachlorocyclopentadiene	ND	330	
2,4,6-Trichlorophenol	ND	330	
2,4,5-Trichlorophenol	ND	330	
2-Chloronaphthalene	ND	330	
2-Nitroaniline	ND	1,700	
Dimethyl phthalate	ND	330	
Acenaphthylene	ND	330	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 30488qc5
Units: ug/kg
Date: March 16, 1993
Blank No: SBLK60-S8095

METHOD BLANK

Compound	Blank Value	PQL	Flags
3-Nitroaniline	ND	1,700	
Acenaphthene	ND	330	
2,4-Dinitrophenol	ND	1,700	
4-Nitrophenol	ND	1,700	
Dibenzofuran	ND	330	
2,4-Dinitrotoluene	ND	330	
2,6-Dinitrotoluene	ND	330	
Diethylphthalate	ND	330	
4-Chlorophenyl phenyl ether	ND	330	
Fluorene	ND	330	
4-Nitroaniline	ND	1,700	
4,6-Dinitro-2-methylphenol	ND	1,700	
N-Nitrosodiphenylamine	ND	330	
4-Bromophenyl phenyl ether	ND	330	
Hexachlorobenzene	ND	330	
Pentachlorophenol	ND	1,700	
Phenanthrene	ND	330	
Anthracene	ND	330	
Di-n-butylphthalate	520	330	
Fluoranthene	ND	330	
Pyrene	ND	330	
Butyl benzyl phthalate	ND	330	
3,3'-Dichlorobenzidine	ND	670	
Benzo(a)anthracene	ND	330	
bis(2-ethylhexyl)phthalate	ND	330	
Chrysene	ND	330	
Di-n-octyl phthalate	ND	330	
Benzo(b)fluoranthene	ND	330	
Benzo(k)fluoranthene	ND	330	
Benzo(a)pyrene	ND	330	
Indeno(1,2,3-cd)pyrene	ND	330	
Dibenz(a,h)anthracene	ND	330	
Benzo(g,h,i)perylene	ND	330	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 30488qc5
Units: ug/kg
Date: March 16, 1993
Blank No: SBLK60-S8095

METHOD BLANK

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	69	35 - 114	23 - 120
2-Fluorobiphenyl	71	43 - 116	30 - 115
p-Terphenyl-d14	66	33 - 141	18 - 137
Phenol-d6	65	10 - 94	24 - 113
2-Fluorophenol	67	21 - 100	25 - 121
2,4,6-TBP	66	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 30488qc6
Matrix: Soil
Date: March 16, 1993
MS/MSD No. 30488-2

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	3,900	ND	2,400	62	2,600	66	6.3	
2-Chlorophenol	3,900	ND	2,300	60	2,500	63	4.9	
1,4-Dichlorobenzene	3,900	ND	420	11	440	11	0	X6
N-nitrosodi-n-Propylamine	3,900	ND	2,200	58	2,300	59	1.7	
1,2,4-Trichlorobenzene	3,900	ND	940	24	930	24	0	X6
4-Chloro-3-Methylphenol	3,900	ND	2,700	69	2,900	75	8.3	
Acenaphthene	3,900	ND	2,100	55	2,300	58	5.3	
4-Nitrophenol	3,900	ND	1,900	48	1,700	43	11	
2,4-Dinitrotoluene	3,900	ND	2,400	63	2,700	70	11	
Pentachlorophenol	3,900	ND	1,300	33	1,600	41	22	
Pyrene	3,900	ND	2,500	64	2,700	69	7.5	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	35	26 - 90
2-Chlorophenol	50	25 - 102
1,4-Dichlorobenzene	27	28 - 104
N-nitrosodi-n-Propylamine	38	41 - 126
1,2,4-Trichlorobenzene	23	38 - 107
4-Chloro-3-Methylphenol	33	26 - 103
Acenaphthene	19	31 - 137
4-Nitrophenol	50	11 - 114
2,4 Dinitrotoluene	47	28 - 89
Pentachlorophenol	47	17 - 109
Pyrene	36	35 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final exract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6268

PROJECT NAME BEI PIER 91
PROJECT NUMBER 624878 MAJOR TASK 7304
SAMPLERS J. PEALE
LAB DESTINATION BEI / S.A.S.

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: VOC	TPH 418.1	TPH 8015	BNA	TOTAL METALS	PCBs	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	2-24-93	1000		X	CP-122B-32-36	3	X	X	X	X	X	X	X		TOTAL METALS/PCBs TO BEI LAB; REST TO S.A.S.
	2-24-93	1000		X	CP-122B-39-41	3	X	X	X	X	X	X	X		

RELINQUISHED BY

SIGNATURE	DATE	TIME
	3-2-93	1005
	3-2-93	12:35P

RECEIVED BY

SIGNATURE	DATE	TIME
	3-2-93	10:05 A
Mary Cowden	3/2/93	12:35

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)